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ABSTRACT

A longitudinal study was planned to track a class in a prekindergarten program to determine program effectiveness. There are many problems in conducting a longitudinal study, most of which revolve around the long-term commitment required. A carefully designed information system is important. For the study in question, computer software and hardware were not available. Attrition of subjects is a central problem in longitudinal studies, but changes in data-gathering personnel can grossly alter the information management system. Data collection activities need to be institutionalized from the beginning of the study, with clear definitions and plans from the outset. The purpose and importance of the longitudinal study must be understood from the beginning, and teachers at all levels should be made to feel part of the study. (Contains 20 references.) (SLD)

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Designing a Longitudinal Study: Issues, Problems & Concerns

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The primary purpose of the longitudinal study was to track the current class of a pre-kindergarten program to determine program effectiveness. Evaluations of early childhood education generally look at the relationship between stated goals of the program and the actual outcomes of the first year. Of course, evaluations looking for evidence of program effectiveness can deliver usable data in a current year through testing, parent interviews or classroom observations. However, some data can only be collected through a longitudinal design. Such trends as the loss of immediate effects or the awakening of latent effects are examples of what can be recognized only through longitudinal studies. If the right longitudinal data is collected, trends can be spotted, programs continuously upgraded and modified and the school stakeholders better served.

Perspective

According to Darlington and Lazar (1982), longitudinal studies can provide a holistic, panoramic understanding of developmental data. The early longitudinal studies of Headstart discovered a "sleeper" effect among the Headstart graduates demonstrating greater than expected achievement in later years after early effects had declined. Such a discovery justified the continued support of Headstart, yet could not have been found except through longitudinal data.

The problems of a longitudinal study are many. The attrition of subjects is an easily recognizable one. Subjects move away, leave school or are otherwise unreachable. Changes in data gathering personnel is another problem. Original personnel retire or go on to other jobs or lose interest. For the evaluation of new programs efficient data collection, including recognition of important data, needs to be established from the beginning. The longitudinal study, by nature, needs a long term commitment. This commitment must be institutionalized in order to pass from current personnel to future successors.

Description of Study

The longitudinal study designed by the authors was interested in assuring that proper data was collected in an efficient manner. To accomplish this, interviews were conducted with district and school personnel. Also, current records and record keeping processes were reviewed. Personnel's input was needed to determine the most logical school office to have the responsibility of data collection. It was important to understand what is currently collected and how it is stored.

The longitudinal follow-up study, by nature, is designed as an ongoing process. The initial data of project will hardly produce any significant results within the first few years. On the other hand, evaluators, administrators, and program teachers may

occasionally want to look at the collected data in order to gain insights into the strength and weakness of the program. In this regard, a carefully designed information management system would prove most instrumental not only because of its ability to store, retrieve and update data but because of its various functions to facilitate data analysis.

There are a number of data sources available to develop such an information management system. An effort was made to take advantage of as many of these sources as possible. Parent input was sought through designed interviews. Teacher questionnaires were especially designed to verify information from other sources. However, the teacher reports could also produce qualitative information that may be lost in student records. Student self-reports would come from exit interviews with those dropping out. Guidance office questionnaires could provide information about 1) records of student participation in extracurricular and community activities; 2) records of disciplinary action; 3)guidance office reports; 4) administrative reports. Results of various state and standardized tests at appropriate grade levels would an intricate part of the data management system.

A computerized tracking system which could follow the progress of individual students through all grade levels would be ideal. Data could be gathered more

efficiently about each student' demographic information, socioeconomic characteristics, school performance, social behavior, and psychological states (Webster & Larson, 1991). Interactions among the variables collected could be readily analyzed. The idea was for a basic program producing simple graphs as analysis of data.

In an effort not to reinvent the wheel, a review of available data processing software was conducted. We were particularly interested in software specifically developed for aiding longitudinal studies. No such software was available at the time. As the school was not ready for computerization, the program was not developed.

Point of View

Follow-up studies are often conducted to make an internal or external evaluation of an educational program, or some aspect of it (Gay, 1987). When these studies are carried on longitudinally, a particular individual or group of individuals will be followed over a substantial period of time to discern the effects of the evaluated (Scriven, 1991). In this way, the merit, value or worth of the program can be determined, and the subsequent policy analysis, program management, and political action facilitated (Borg & Gall, 1989).

Over the last few decades or so preschool prevention programs have provided services to large numbers of disadvantaged American children so as to reduce the

number of students who are retained at higher grade levels, lower the dropout rate, and improve the chances for at risk students with regard to school success. When investigators began follow-up studies of such programs two or three years after their termination, the program children showed little sustained advantage resulting from the intervention (Hetherington & Parke, 1986). When evaluators did longitudinal follow-up studies instead, however, evidence of the positive effects of preschool intervention programs immediately started to accumulate (Lazar & Darlington, 1982; Hans, 1987; Sevigny, 1987; Lee et al., 1989).

Importance to Field

The pre-kindergarten program of this study, first established in 1989, was designed to meet the needs of three- and four- year-olds who have been identified as at-risk for being unprepared for school. Based on a curriculum of goals, objectives and activities organized around the children's full development, this program has strived to create a warm, loving, stimulating environment. Its goals have been 1) to support each child's own learning priorities, 2) to allow children to acquire a solid sense of security, positive self-esteem and 3) to develop in the child a long term love of learning as they progress through school.

In order to find out the true effectiveness of an early intervention program with such long-term goals, a

longitudinal follow-up study should be organized to answer the question: Does a child's growth continue to be enhanced after the intervention period (Hans, 1987)? It is usually desirable in a follow-up study to attain data on a comparison group equated at least crudely to the "experimental" cases on the obvious demographic variables (Cronbach, 1983). Therefore, the proposed follow-up study should answer another question as well: How do the program children compare with control children in terms of their social, cognitive, and emotional development?

A particular concern of the district was reflected in the longitudinal study and goes beyond the judgment of merit and worth of the current program. That concern is the previously established ineffectiveness of another program for disadvantaged children several years past. The program was a pre-first and was perceived to be effective for a long time. In reality a longitudinal study using archival data demonstrated that it was not fulfilling its stated purpose of preparing children for school. It was hoped that through the designed study, the right information could be effectively analyzed. The effect would be that the pre-kindergarten program could be recognized for its long range effects early enough to make a difference.

Variables in Longitudinal Studies

As noted before, longitudinal follow-up studies of early intervention programs generally investigate issues

involving program participants' later school success or failure. Interviews with the district personnel and experts in the field in this reported study also helped to clarify additional issues of importance. These issues can be addressed in relation to various factors such as 1) socioeconomic characteristics (e.g., family mobility, number of siblings, and number of parents residing with the student), 2) school performance (e.g., attendance, work habits, GPA, standard test scores, grade placement, retention, and referral to special education or social service), 3) social behavior (e.g., socialization patterns, violation of school regulations, involvement in the juvenile justice system), 4) developmental status (e.g., cognitive, social, and motor development), and 5) psychological states (e.g., self-esteem, educational aspirations, and sense of efficacy). In this reported study, these factors were to be updated through the teacher and counselor surveys and consolidated on the data collection form. These factors are important indicators of program effectiveness on the assumption that the effects of an early intervention program should be recognizable after the intervention period.

Indicators of socioeconomic status are important factors to be studied since relevant literature demonstrates they have a close correlation with the conditions of children-at-risk (Lally, 1987; Rachal & Garbo, 1988). In the teachers survey and the guidance

counselor survey, standard indicators of socioeconomic status such as eligibility for free lunch, parents' occupation, parents' education level are asked for each survey year. Though there is little in the literature to indicate the effects of changed socioeconomic status on the child-at-risk, this information can easily be obtained by a longitudinal study and would contribute to an enhanced understanding.

The continual consideration of the student's situation was reflected, by design, in survey items asking the current status of other correlates of the "at-risk" classification. These include the current family structure, the number of siblings, the family mobility and access to social services (Webster & Lawson, 1991). Because the literature indicates the child who has been retained is at increased risk for dropping out, this has been included as a variable to be studied (Shepard & Smith, 1989).

School performance is another area usually investigated in longitudinal follow-up studies (Sevigny, 1987). The factors from this area are reflected in the items on the teachers and the counselor surveys associated with academic development, school interventions and quartile range on standardized tests. These factors are important to be studied because they most accurately reflect the child's adaptation to the educational environment and values (Rachal & Garbo, 1988;

Sevigny, 1987). This adaptation is most notable objective of early intervention (Hubbell, 1983; Lazar & Darlington, 1982).

Another objective of early intervention and a frequent variable in longitudinal follow up studies is the enhancement of social behavior (Hubbell, 1983). In this reported study, the measurement of this enhancement was to be accomplished through the items on the teachers and the counselor surveys in the areas of social development and student's behavior. In the guidance counselor survey, there are additional sections asking the student's involvement with crime or other delinquent behaviors. The conditions that lead the child to be classified as "at-risk" may also contribute to delinquency (Lally, 1987; Lloyd, 1978). Still, in analysis of the data it should be noted that the causes of delinquency are many and may have nothing to do with the presence or effectiveness of intervention (Patterson & Stouthamer-Loeber, 1984).

Developmental status across domains in early childhood is measured by the developmental screening instrument, ESI, in pre-kindergarten and/or kindergarten. The literature indicates these measures should have little correlation with measures taken after the middle of the kindergarten year (Bloom, 1964). However, they are important to collect in a longitudinal study in order to plot the growth pattern of the child as a whole

(Bloom, 1964). Additionally, in analysis of the data, previously unrecognized trends or correlations may become apparent (Sattler, 1982).

The self efficacy, self esteem and other psychological states of the student are important to recognize. Some children thought to be at-risk have proven to be remarkably resilient in difficult life circumstances (Werner, 1991). If program participants demonstrate such a resiliency based on positive mental attitudes, such a finding would be indicative of the program's effectiveness (Rachal & Garbo, 1988). Elements of productive psychological states were intended to be derived from the open questions at the end of the teachers and the counselor surveys.

Institutionalized Commitment

As noted before certain problems exist for a longitudinal study such as the attrition of subjects. However, changes in data gathering personnel can grossly alter the information management system. The use of archival data planned for the evaluation of a pre-existing program is fine if one can guarantee its efficient management after the original personnel are gone. There is no guarantee that the salient data has been gathered or accurately stored. For new programs efficient data collection, including recognition of important data, needs to be established from the beginning. The longitudinal study, by its nature, needs

a long term commitment. Again, this commitment must be institutionalized in order to pass from current personnel to future successors. This commitment has to be expressed in terms of certain issues.

1) The design of the program to be evaluated needs a full and comprehensive description in order to better understand any correlational findings from the longitudinal study.

2) The data collection system has to be easily understood by district personnel in order to be readily entered and accessed.

3) There needs to be a clear plan from the beginning for analysis of data annually or at pertinent intervals.

4) Responsibilities for data collection, analysis and supervision need to be fitted into already existing job descriptions. As personnel change, responsibilities can remain.

5) The purpose and importance of the longitudinal study needs to be understood district wide. Teachers at all levels should be made to feel part of the study and important contributors.

It is assumed in longitudinal studies that the task of data collection will change hands over the years. However, if record keeping is already part of an employee's job description then data gathering task can be incorporated into that job description. However, the

dedication and seriousness shown the task by district professionals may make one of them the more logical choice. Also the accessibility of some new data may make it a task for a professional, e.g. the school psychologists.

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